ORDER NO. HAD8605521C8

Service Manual

Stereo Integrated Amplifier

Amplifier

SU-X33

Color

(K) . . . Black Type

Color	Area
(K)	[EX] . . . . Continental Europe
(K)	[EH] . . . . Holland
(K)	[EB] . . . . Belgium
(K)	[EF] . . . . France
(K)	[EK] . . . . United Kingdom
(K)	[EG] . . . . F.R. Germany
(K)	[Ei] . . . . . Italy
(K)	[XL] . . . . Australia
(K)	[XA] . . . . Asia, Latin America, Middle Near East, Africa & Oceania
(K)	[PC] . . . . European Audio Club

SPECIFICATIONS

(DIN 45 500)

■ AMPLIFIER SECTION

1 kHz continuous power output
both channels driven 2 × 30W (8Ω)
Total harmonic distortion
half power at 1 kHz 0.07% (8Ω)
Damping factor 22 (8Ω)
Input sensitivity and impedance
PHONO, TUNER, CD, AUX, TAPE 150 mV/22kΩ
S/N
rated power (8Ω)
PHONO, TUNER, CD, AUX, TAPE
85 dB (IHF, A: 90 dB)
Frequency response
PHONO, TUNER, CD, AUX, TAPE
10 Hz~60 kHz (−3 dB)
Graphic equalizer frequency
80 Hz, 250 Hz, 1 kHz, 4 kHz, 12.5 kHz
Graphic equalizer range of variation ±10 dB
Muting −20 dB
Output voltage
REC OUT 150 mV
Channel balance, AUX 250 Hz~6,300 Hz ±1 dB
Channel separation, AUX 1 kHz 55 dB
Headphones output level and impedance
360 mV/330Ω
Load impedance 8Ω~16Ω

■ GENERAL

Power consumption 170W
Power supply
For Australia AC 50 Hz/60 Hz, 240V
For continental Europe AC 50 Hz/60 Hz, 220V
For others AC 50 Hz/60 Hz, 110V/127V/220V/240V
Batteries (Remote-control transmitter) DC 3.0V
(2 "AA" size batteries, R6 or equivalent)
Dimensions (W×H×D) 315 × 75 × 247 mm
(12-13/32" × 2-15/16" × 9-23/32")
Weight 3.9 kg (8.6 lb.)

Note:
Total harmonic distortion is measured by the digital spectrum analyzer (H.P. 3045 system).

Specifications are subject to change without notice for further improvement.

NOTES :

1. The power of the tuner in this system are supplied through the amplifier. When servicing these components, prepare an amplifier or an external power supply. (For how to use the fixture, refer to the Service Manual of tuner and tape deck.)
2. Prepare a transmitter and an amplifier when checking each model of system for its performance using the remote control.

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

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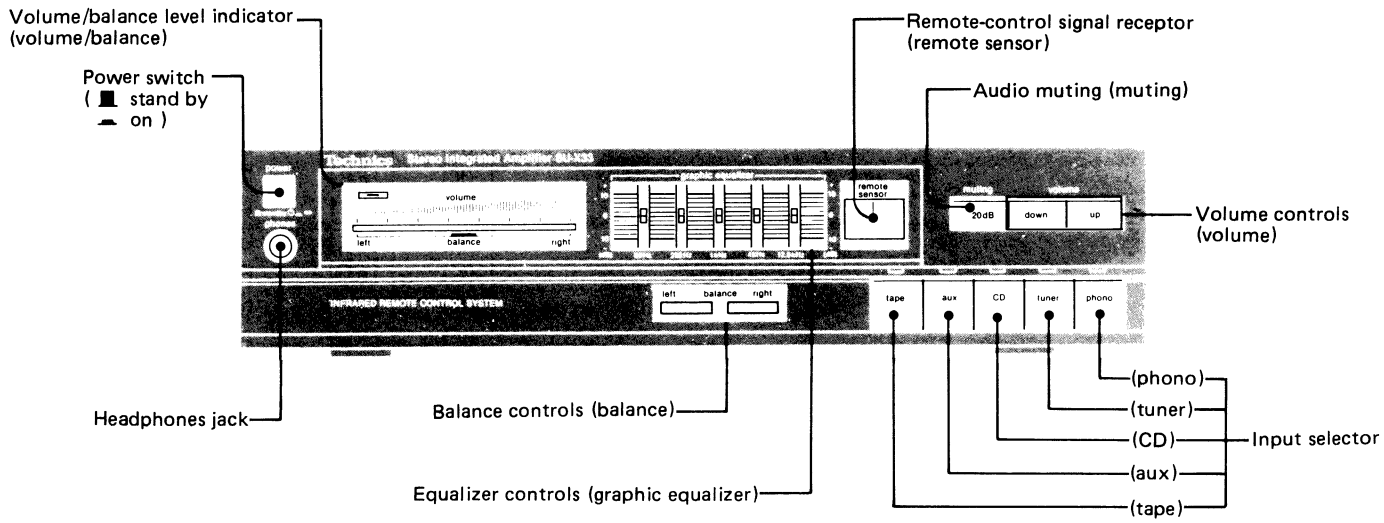
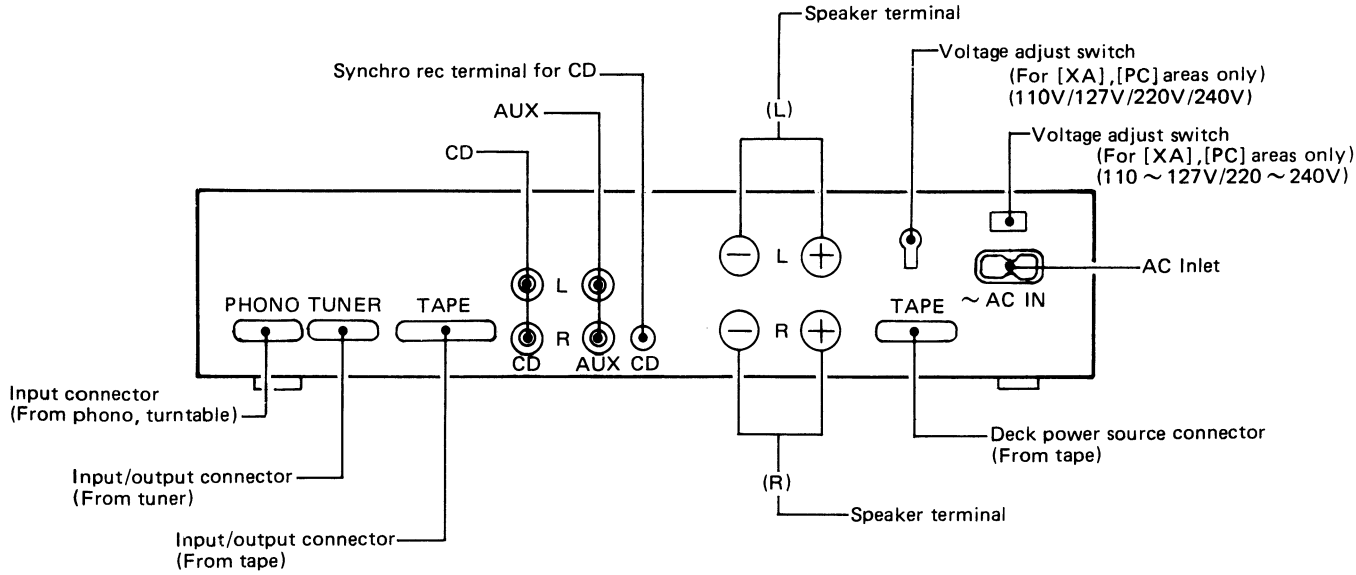
■ LOCATION OF CONTROLS



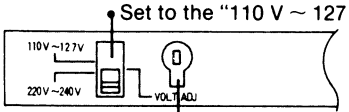


• Before use

WARNING: To avoid any serious damages, strongly be sure the voltage setting of the both voltage adjust switches according to the area. Be sure to disconnect the mains cord before adjusting both voltage adjust switches.

Use a minus (−) screwdriver to set the voltage adjust switches.

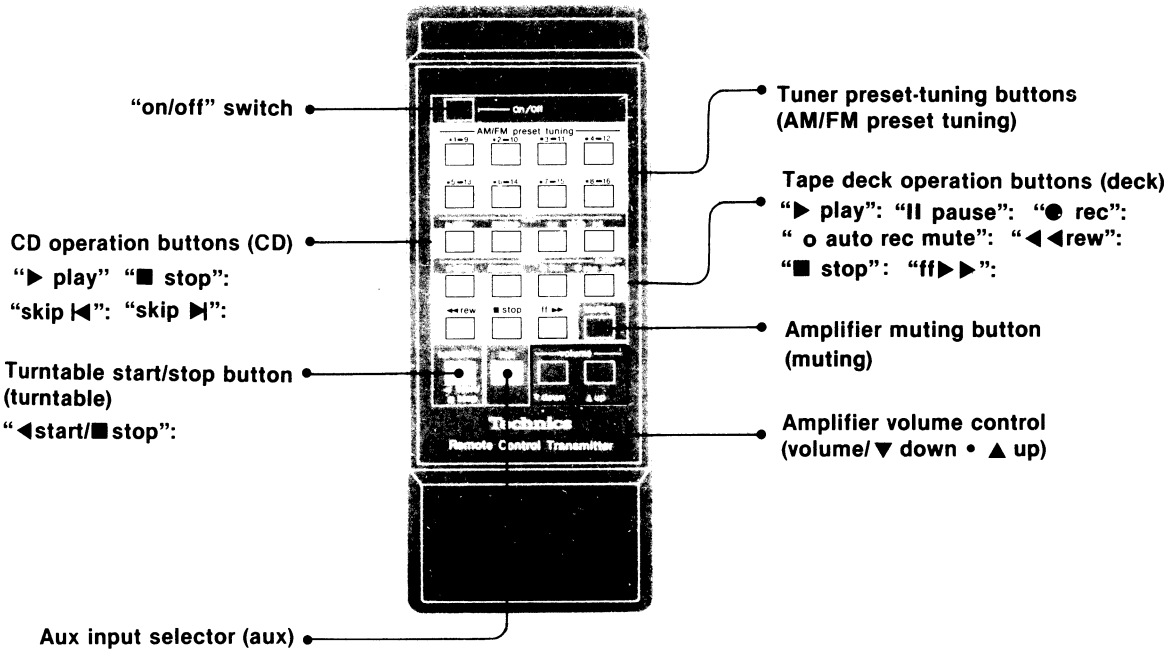
1. **This amplifier is already set to the "220 V ~ 240 V" position before shipment.**
   If the power supply in your areas is 110 V ~ 127 V,
   Set to the "110 V ~ 127 V" position.



2. **Set to the voltage setting for the area in which the unit will be used.**

(If the power supply in your area is 117 V or 120 V, set to the "127 V" position.)

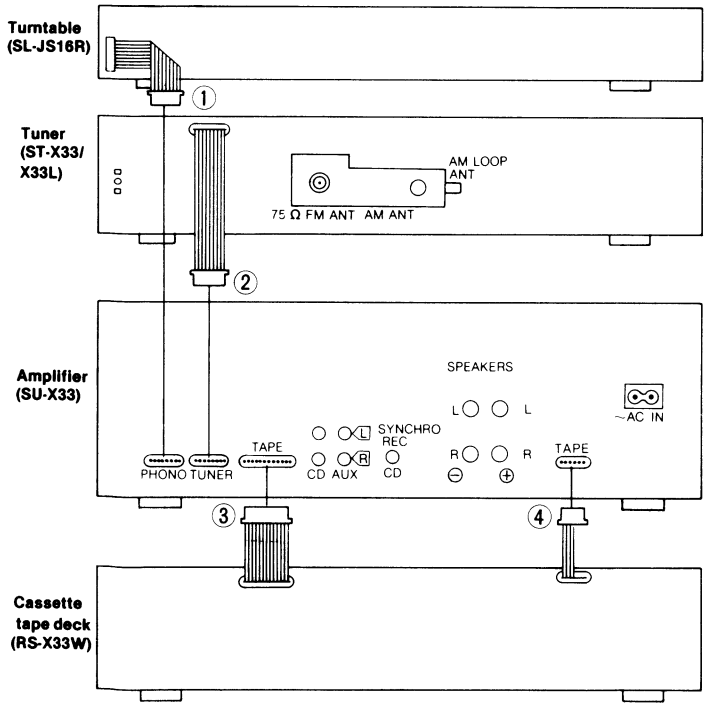
Note:
There are no voltage adjust switches for some countries; the correct voltage is already set.

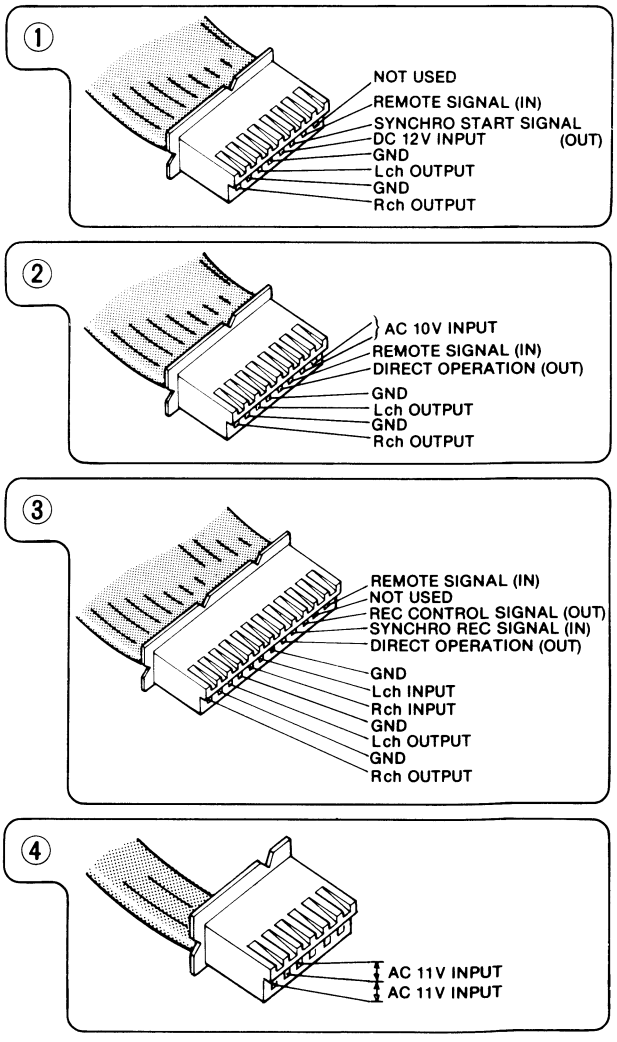

"on/off" switch
CD operation buttons (CD)
"▶ play" "■ stop":
"skip ⏮": "skip ⏭":
Turntable start/stop button (turntable)
"◀start/■stop":
Aux input selector (aux)
Tuner preset-tuning buttons (AM/FM preset tuning)
Tape deck operation buttons (deck)
"▶ play": "II pause": "● rec":
" o auto rec mute": "◀◀rew":
"■ stop": "ff▶▶":
Amplifier muting button (muting)
Amplifier volume control (volume/▼ down • ▲ up)
Technics
Remote Control Transmitter

■ HOW TO CONNECT

Connect the turntable, tuner, amplifier, and cassette deck as shown.
If the connection is wrong, normal operation will not be attained.

* Tuner (ST-X33/X33L), Turntable (SL-JS16R) and Cassette deck (RS-X33W) are not equipped with power supply.
So the amplifier shown or power supply fixture is necessary for the repair and check to Tuner, Turntable and Cassette deck.





■ PROTECTION CIRCUITRY

The protection circuitry may have operated if either of the following conditions is noticed:

- No sound is heard when the power is turned on.
- Sound stops during a performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are "shorted", or if speaker systems with an impedance less than the indicated rated impedance of this unit are used.

If this occurs, follow the procedure outlines below:

1. Turn off the power.
2. Determine the cause of the problem and correct it.
3. Turn on the power once again after one minute.

Note

When the protection circuitry functions, the unit will not operate unless the power is first turned off and then on again.

■ BEFORE REPAIR AND ADJUSTMENT

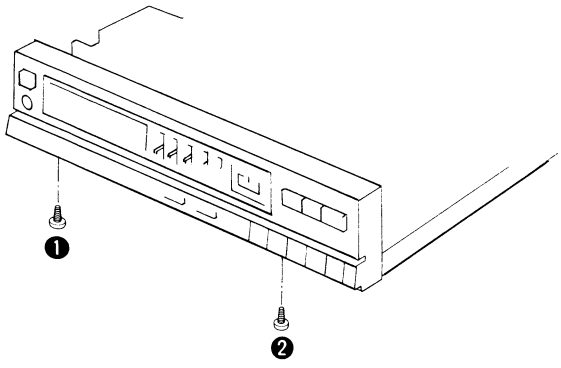
(1) Turn off the power supply. Using a 10Ω, 5W resistor, shortcircuit both ends of power supply capacitors (C601, C602,) in order to discharge the voltage.

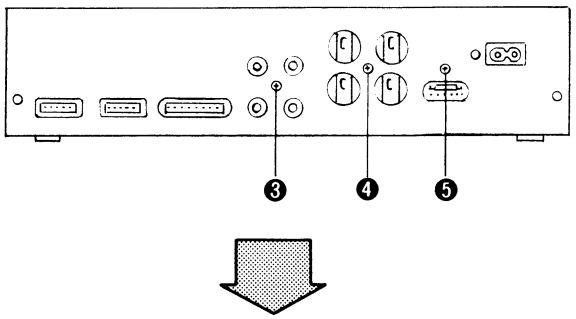
(2) Before turning the power supply on, after completion of repair, slowly apply the primary voltage by using a power supply voltage controller to make sure that the consumed current at 50/60 Hz in NO SIGNAL mode should be shown below with respect to supply voltage 110V/127V/220V/240V.

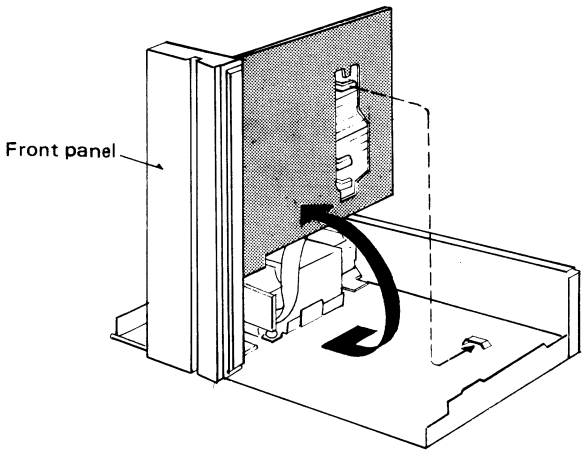
Power supply voltage		AC110V	AC127V	AC220V	AC240V
Consumed current	50Hz	130 ~ 210mA	130 ~ 210mA	80 ~ 115mA	65 ~ 125mA
	60Hz	140 ~ 220mA	120 ~ 200mA	75 ~ 120mA	60 ~ 115mA

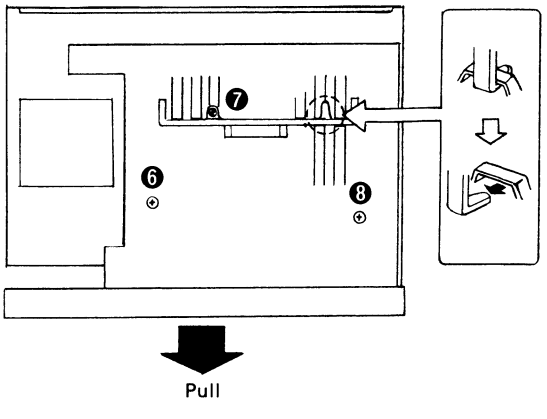
■ DISASSEMBLY INSTRUCTIONS

Ref. No. 1	How to remove the main P.C.B.
Procedure 1	1. Remove the cabinet. 2. Remove the 2 screws (❶ , ❷). 3. Remove the 3 screws (❸ ~ ❺). 4. Remove the 3 screws (❻ ~ ❽). 5. Remove the main P.C.B. in the direction of the arrow.









ORDER NO. HAD8609714P8

Parts Change Notice

Model No. SU-X33

Service Manual
Order No. HAD8605521C8

Please revise the original parts list in the Service Manual to conform to the change (s) shown herein. If new part numbers are shown, be sure to use them when orderring parts.

Reason for Change *The circled item indicates the reason. If no marking, see the Notes in the bottom column.

1.	Improve performance
2.	Change of material or dimension
3.	To meel approved specification
4.	Standardization
5.	Addition
6.	Deletion
7.	Correction
8.	Other

Interchangeability Code **The circled item Indicates the interchangeability. If no marking, see the Notes in the bottom column.

	Parts		Set Production	
A	Original	→	Early	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.
	New	→	Late	
B	Original	→	Early	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts where possible, then stock new parts.
	New	→	Late	
C	Original	→	Early	New parts only may be used in early or late production sets. Stock new parts.
	New	→	Late	
D	Original	→	Early	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.
	New	→	Late	
E	Other			

Part Number

Model No.	Ref. No.	Original Part No.	New Part No.	Notes(***)	Part Name & Descriptions	Pcs/Set
SU-X33	105	UR64BT123A	UR64BT123A	7, C	Button (Black)	24
			UR64BT123DA		Rec Button (Red)	1

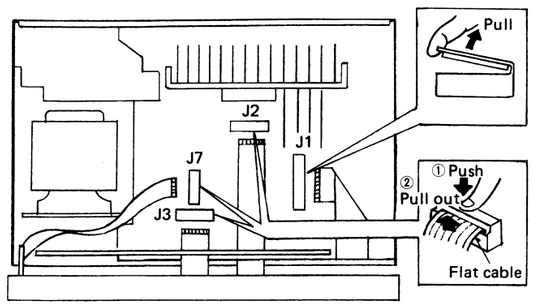
File this Parts Change Notice with your copy of the Service Manual.

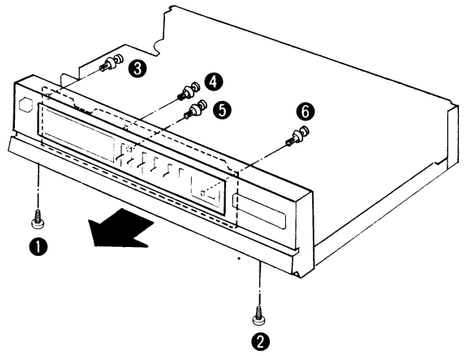
Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

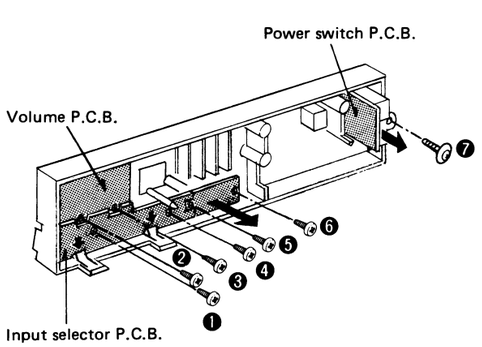
Printed in Japan
860900270 ® TM

Ref. No. 2	How to remove the front panel
Procedure 2	1. Remove the cabinet. 2. Remove the connectors. (J1, J7). 3. Remove the 2 screws (❶, ❷) 4. Remove the 4 lock pins (❸ ~ ❻).

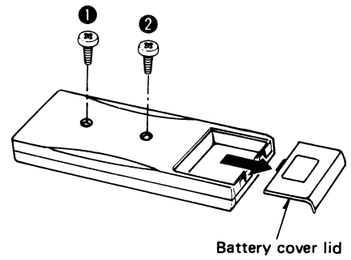




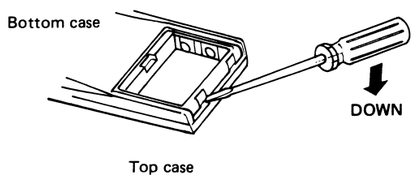
Ref. No. 3	How to remove the P.C.B.
Procedure 2 →3	1. Remove the 6 screws (❶ ~ ❻). 2. Remove the volume and input selector P.C.B. 3. Remove the 1 screw (❼). 4. Remove the power switch P.C.B.



Ref. No. 4	How to remove the remote control
Procedure 4	1. Remove the battery cover lid. 2. Remove the 2 screws (❶, ❷)



3. Insert a blade screwdriver between the top and bottom case inside the battery compartment and then slowly loosen the bottom case.



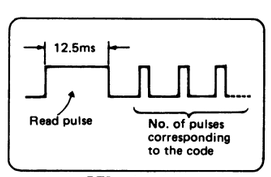
■ FUNCTION OF IC TERMINALS

• IC301 (LC6523C–3068) Microcomputer

Pin No.	Mark	Description
①	LED 4	"L" level output is given to each pin according to the volume attenuation in order to light up the volume level LED.
③	LED 5	
④	LED 6	
⑤	LED 7	
㉘	LED 1	
㉙	LED 2	
㉚	LED 3	
⑥	BACK-UP	• When this pin is at "L" level, the microcomputer is operated by the back-up circuit.(No. ⑲ pin alone receives an input, all the others not.) • When this pin is at "H" level, No.⑨pin (POWER ON) gives an "L" level output if No. ⑫ pin (POWER SW) is at "H" level. No.⑨pin (POWER ON) is at "H" level, however, if the remote control's power on/off RAM data are off.
⑦	REMOTE	• Data codes reach here from the remote control receiver. (For data codes, refer to the remote control transmitter description.) • The tape deck data codes are outputted from the light receiver direct to the deck.
⑧	AMP	• When this pin receives an "H" level input, the amplifier turns on to start the operation. • When this pin receives an "L" level input, the amplifier turns off to stop receiving the matrix key. Power on/off code alone is used to enable the remote control. • Just when this pin's input comes from "H" to "L" level, the LED1 ~ LED7 pins become "H".
⑨	POWER ON	• A rising level ("H" level) is detected at No. ⑩ pin to give an "L" level output to No.⑨pin (POWER ON). • When No. ⑩ pin is at "L" level, No.⑨pin is given an "H" level output (POWER OFF).
⑩	POWER SW	
⑪	DECK	• Not used.
⑫	ST/DTS	• When "Tuner" code is fed from the remote control to No.⑦pin, The DTS code is outputted at pin No. ⑫ SELECTOR code is then outputted to make the input selector into TUNER mode. • If the remote control's CH button has been kept depressed for longer than 1.5 seconds, 15 output pulses (AM code) are fed to the tuner and the number of pulses for a specified channel is given. • If the button has been released within 1.5 seconds 13 output pulses (FM code) are fed to the tuner and the number of pulses for a specified channel is given.
⑬	DATA/S1	Together with No. ⑫ pin, Volume UP/DOWN and BALANCE L/R signals are fed to the to the attenuator IC.
⑭	CLK	
⑮	OSC 2	Crystal hook-up terminals for internal clock oscillator.
⑯	OSC 1	
⑲	RES	Reset pulse input terminal. When a reset is made by the back-up circuit using electrolytic capacitors alone, 3 or 4 control RAM data are checked by the program. COLD START is activated when abnormal, HOT START when normal.
⑳	K2	Input terminals for matrix keys.
㉑	K1	
㉒	K0	
㉓	D_A/SO	Input selector 4-bits BCD codes are outputted with Remote Control codes. * With Turntable "START" code, the output is given in the order of No. 1 → No. 2 → No. 6 → No. 1.
㉔	D_B	
㉕	D_C	
㉖	D_D	
㉗	LOUD	Not used.

–dB / LED	1	2	3	4	5	6	7
Pin No.	㉘	㉙	㉚	①	③	④	⑤
0~ –4dB	○	○	○	○	○	○	○
–6~–10	○	○	○	○	○	○	
–12~–18	○	○	○	○	○		
–20~–26	○	○	○	○			
–28~–36	○	○	○				
–38~–52	○	○					
–54~∞	○						

○ mark = Light up = "L" level output



DTS code pulses

Function	No. of output pulses
CH 1 (CH 9)	0
CH 2 (CH 10)	1
CH 3 (CH 11)	2
CH 4 (CH 12)	3
CH 5 (CH 13)	4
CH 6 (CH 14)	5
CH 7 (CH 15)	6
CH 8 (CH 16)	7
FM	13
AM	15

No.	Selector	D_A	D_B	D_C	D_D
1	—	L	L	L	H
2	PHONO	L	L	H	L
3	TUNER	L	L	H	H
4	CD	L	H	L	L
5	TAPE	L	H	H	L
6	TURNTABLE START	H	L	L	L
7	TURNTABLE STOP	H	L	L	H
8	AUX	L	H	L	H

Notes:
(A) Key n
functi

OUT	
S0	No.2
S1	No.1

(B) Volume
1. Push
down
2. Keep
the v
matic
3. An "
accor

(C) Balanc
1. Push
left (

• IC302 (D
The micr
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An "L"
positions;
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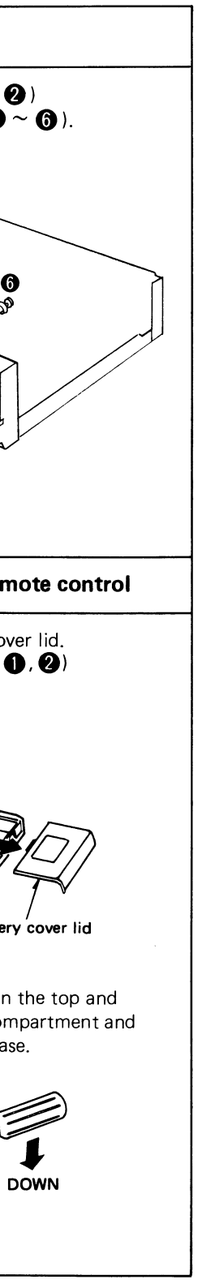
of IC301.

• IC101 (

TUNER
PHONO
CD
AUX
TAPE PLAYBACK

SOURCE OUT



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㉘	LED 1	
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㉚	LED 3	
⑥	BACK-UP	• When this pin is at "L" level, the microcomputer is operated by the back-up circuit.(No. ⑲ pin alone receives an input, all the others not.) • When this pin is at "H" level, No.⑨pin (POWER ON) gives an "L" level output if No. ⑫ pin (POWER SW) is at "H" level. No.⑨pin (POWER ON) is at "H" level, however, if the remote control's power on/off RAM data are off.
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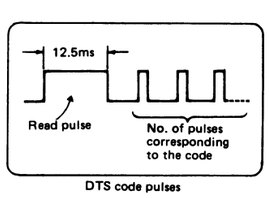
㉔	D_B	
㉕	D_C	
㉖	D_D	
㉗	LOUD	Not used.

–dB / LED / Pin No.	1 (㉘)	2 (㉙)	3 (㉚)	4 (①)	5 (③)	6 (④)	7 (⑤)
0 ~ –4dB	○	○	○	○	○	○	○
–6 ~ –10	○	○	○	○	○	○	
–12 ~ –18	○	○	○	○	○		
–20 ~ –26	○	○	○	○			
–28 ~ –36	○	○	○				
–38 ~ –52	○	○					
–54 ~ ∞	○						

○ mark = Light up = "L" level output



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CH 7 (CH 15)	6
CH 8 (CH 16)	7
FM	13
AM	15

No.	Selector	D_A	D_B	D_C	D_D
1	—	L	L	L	H
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3	TUNER	L	L	H	H
4	CD	L	H	L	L
5	TAPE	L	H	H	L
6	TURNTABLE START	H	L	L	L
7	TURNTABLE STOP	H	L	L	H
8	AUX	L	H	L	H

Notes:

(A) Key matrix, scanning signal input/output pins and their functions ("H" level scan)

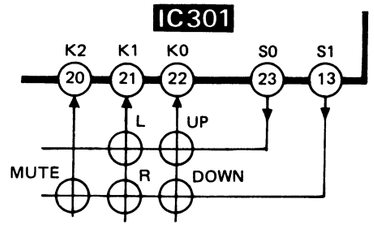
OUT \ IN	K0 No.22	K1 No.21	K2 No.20
S0 No.23	Volume UP	Balance L	
S1 No.13	Volume DOWN	Balance R	Muting

(B) Volume UP/DOWN

1. Push the key once, and the volume will turn up (or down) by 2dB each steps.
2. Keep the key depressed for more than 250msec, and the volume will turn up (or down) all the way automatically.
3. An "L" level output is given at LED1 ~ LED7 pins according to the volume attenuation.

(C) Balance LEFT/RIGHT

1. Push the key once, and the balance will shift to the left (or right) channel by 2dB. At the same time, the "Volume/Balance" indicator (LED1 ~ LED7) is switched to the Balance position. (The Balance indication goes on for about 4 ~ 6 seconds after the Balance key is released.)
2. Keep the key depressed for more than 500msec, the automatic shift mode will be invited.



(D) Mute

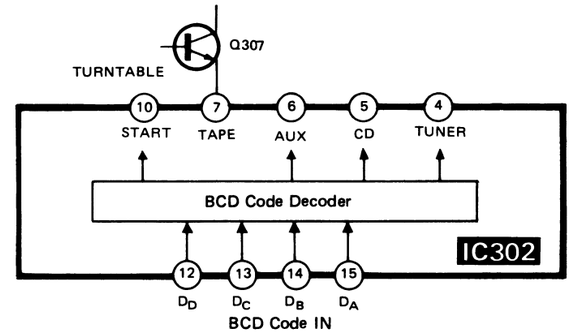
For ON/OFF switching of audio muting fanction.By a push on this key, the audio muting is turned on and the terminal output of the highest step of volume display LED 1 ~ 7 flashing.

• IC302 (DN74LS145) BCD Decoder

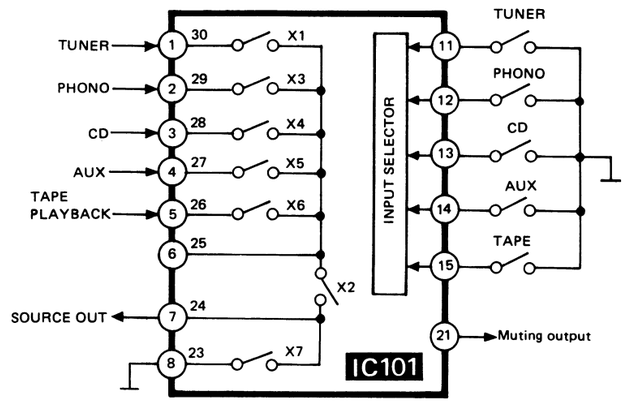
The microcomputer (IC301) codes are fed via its No. ㉓ ~ No. ㉖ pins to the IC252's No. ⑫ ~ No. ⑮ pins. An "L" level output is given according to the selector positions; now the input selector IC (IC101) receives the output as a switching signal. (For the input codes to IC302, refer to the list of codes under No. ㉓ ~ No. ㉖ pins of IC301.)

* Q307 is a transistor to keep Tape Deck from switching from recording mode to playback mode, which might be otherwise caused by possible error data transfer from the remote control. (An "H" level input comes from the tape deck to the amplifier while in recording mode.)

* No.⑨pin is not used in this model.



• IC101 (LC7818) Input Selector



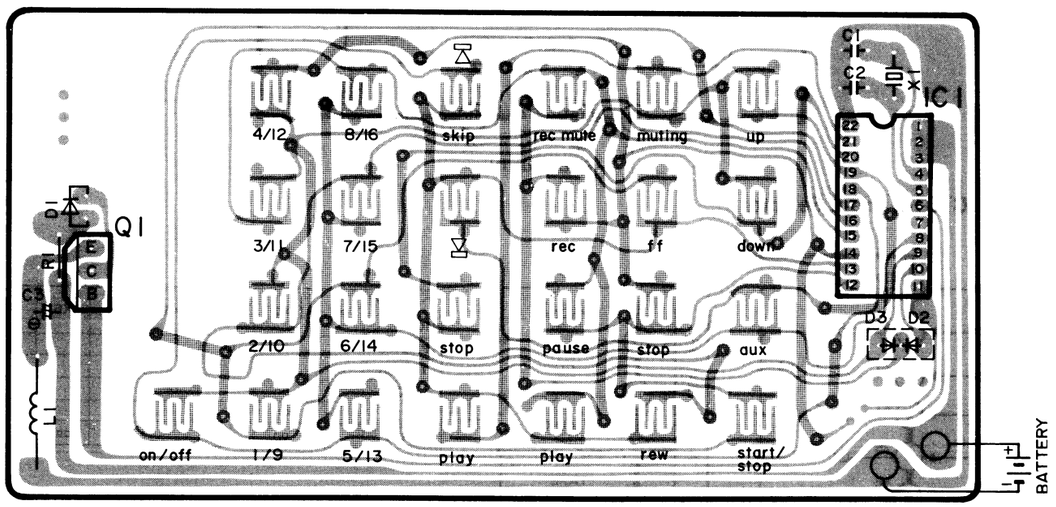
SW / MODE	X1	X2	X3	X4	X5	X6	X7
PHONO		on	on				
TUNER	on	on					
CD		on		on			
AUX		on			on		
TAPE		on				on	

• **IC202 (TC9177P) Attenuator**

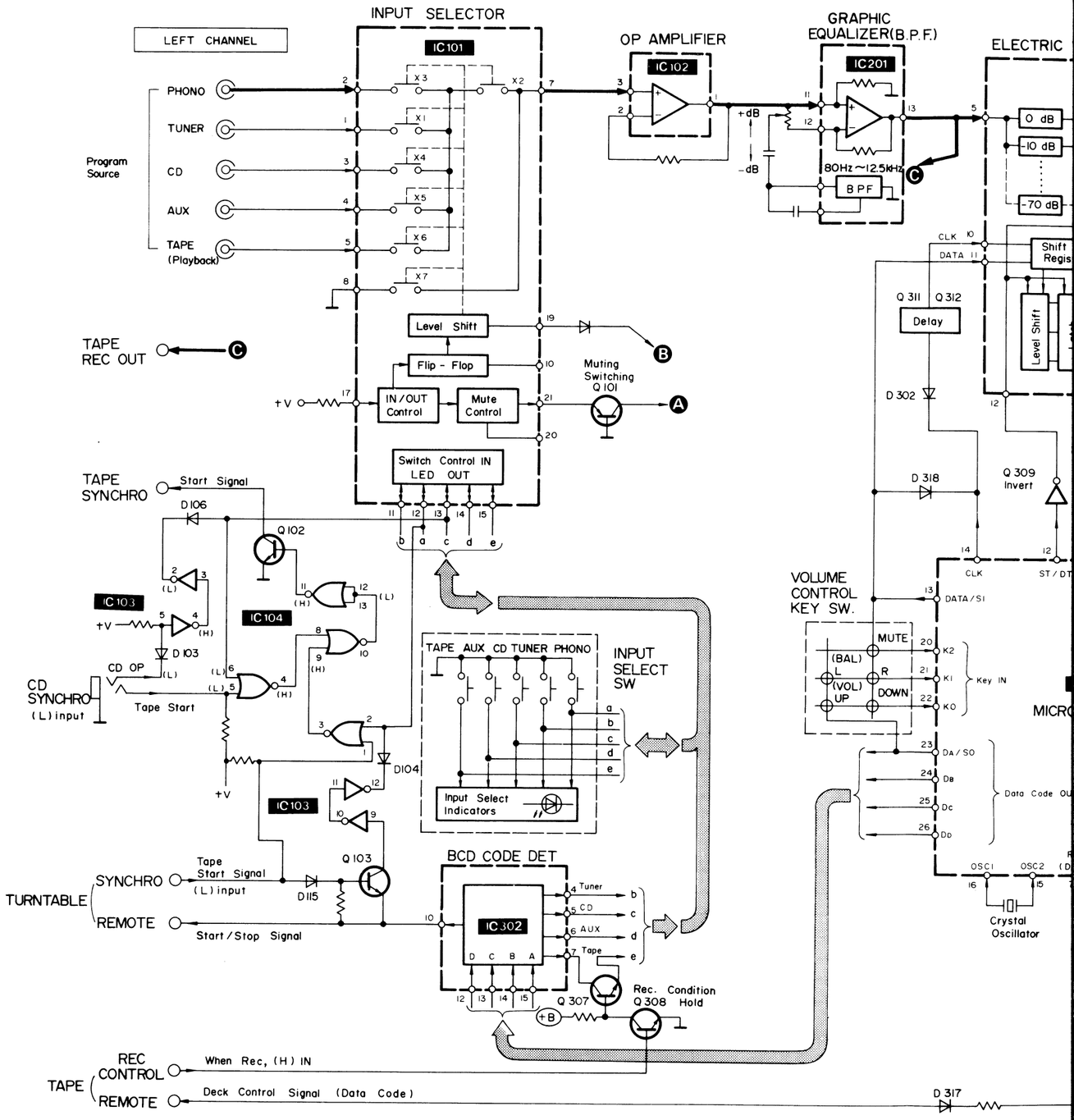
Pin No.	Mark	Description
1	V_{SS}	Power supply (negative).
2, 3 18, 19	CH1-Loudness 1, 2 CH2-Loudness 1, 2	Loudness terminal.
4 17	CH1-OUT 1 CH2-OUT 1	10dB attenuator output. Signal via IN is attenuated by 8 steps, 10dB each, from 0 ~ 70dB.
5 16	CH1-IN 1 CH2-IN 1	10dB attenuator input.
6 15	A-GND	AC grounding terminal.
7 14	CH1-IN 2 CH2-IN 2	2dB attenuator input.
8 13	CH1-OUT 2 CH2-OUT 2	2dB attenuator output. Signal via IN is attenuated by 5 steps, 2dB each, from 0 ~ 8dB.
9	GND	Grounding terminal.

Pin No.	Mark	Description
10	CK	Clock input. Used to take in data at DATA pin.
11	DATA	Attenuation/channel select data input. 20-bits input activated by CK signal.
12	ST	Strobe input. Attenuation/channel select data from DATA and CK pins are lapped when this pin is at "H" level. Previous data remain the same while this pin does not reach "H" level.
20	V_{DD}	Power supply (positive).

■ CIRCUIT BOARDS OF REMOTE CONTROL UNIT (Transmitter)

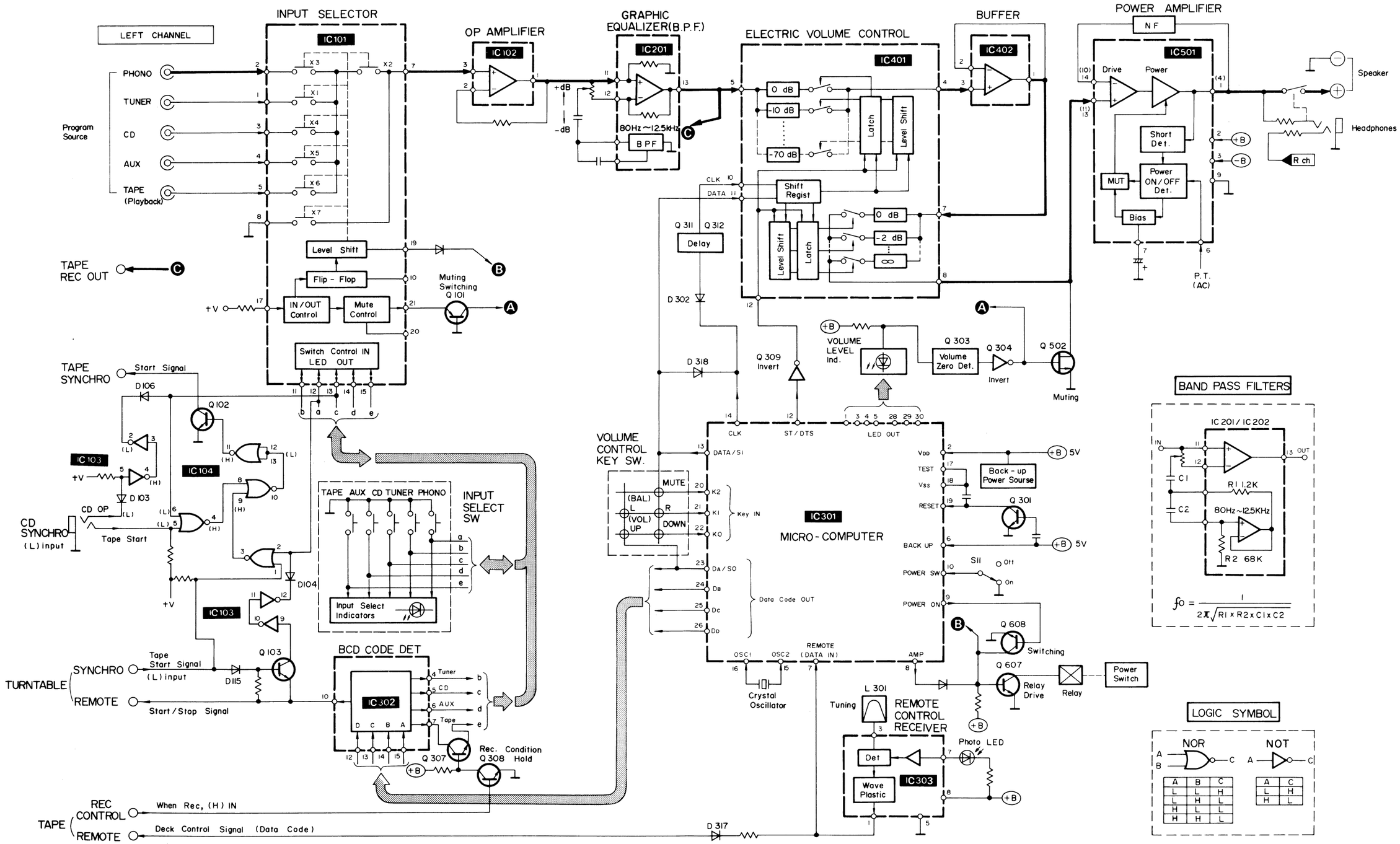


■ BLOCK DIAGRAM



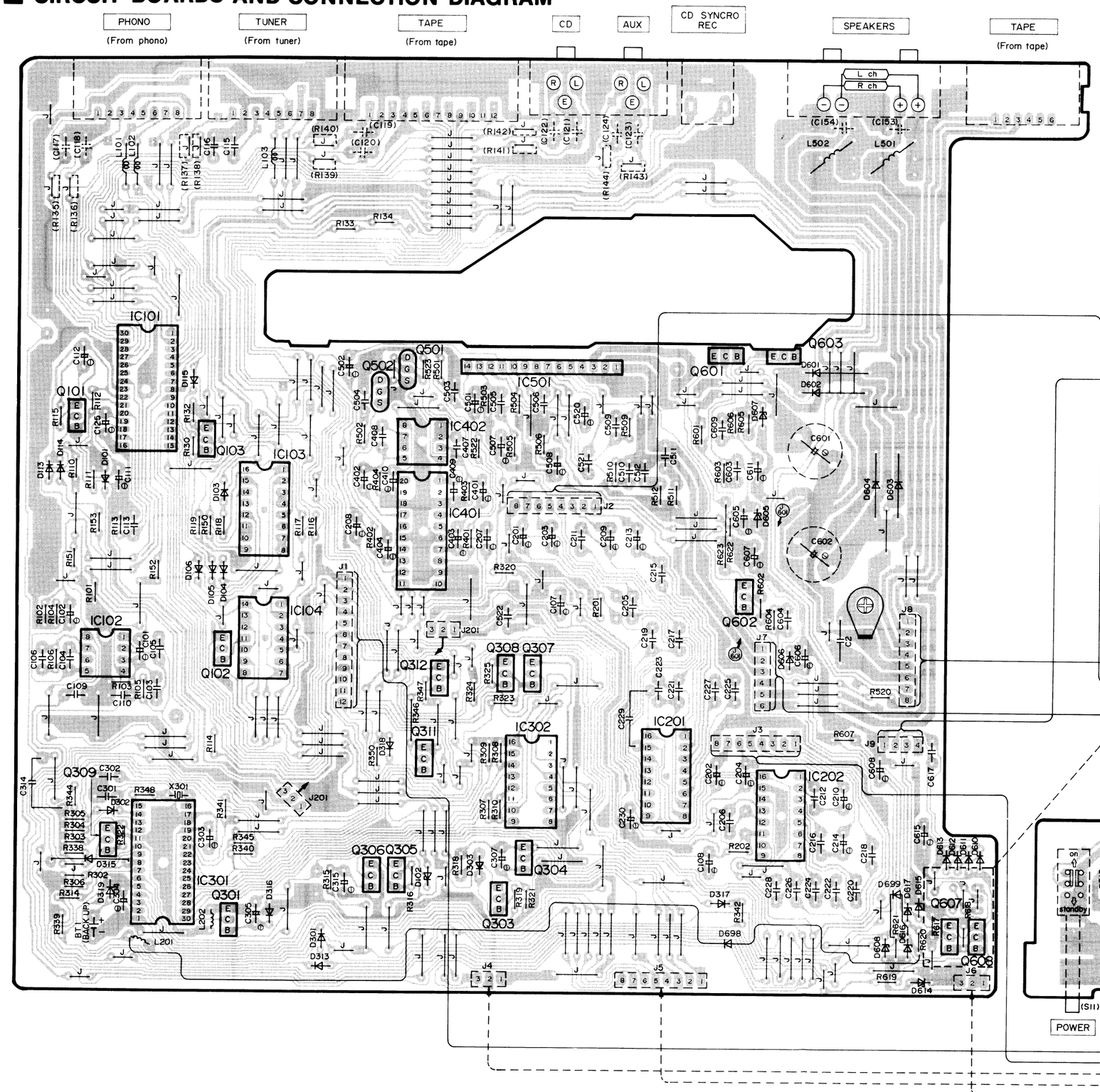
iption
in data at
channel select
activated by
channel select ATA and CK d when this level. remain the is pin does ' level.
(positive).

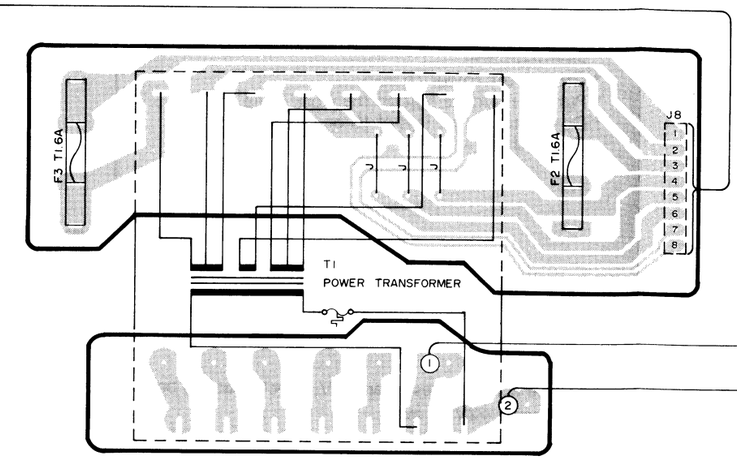
■ BLOCK DIAGRAM

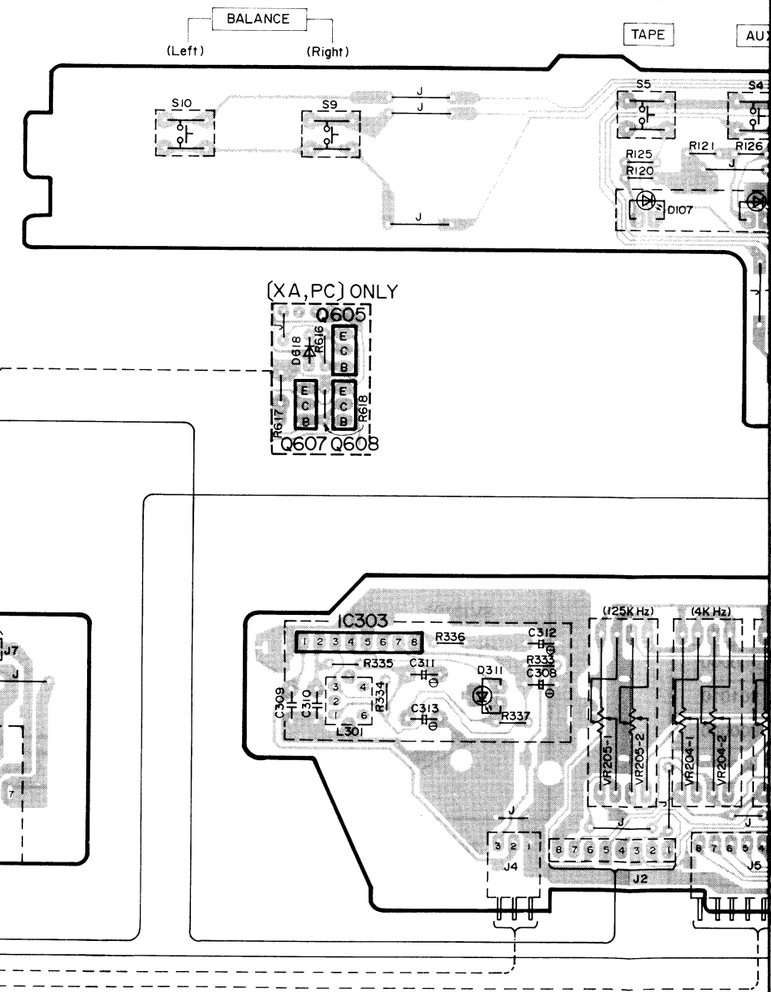


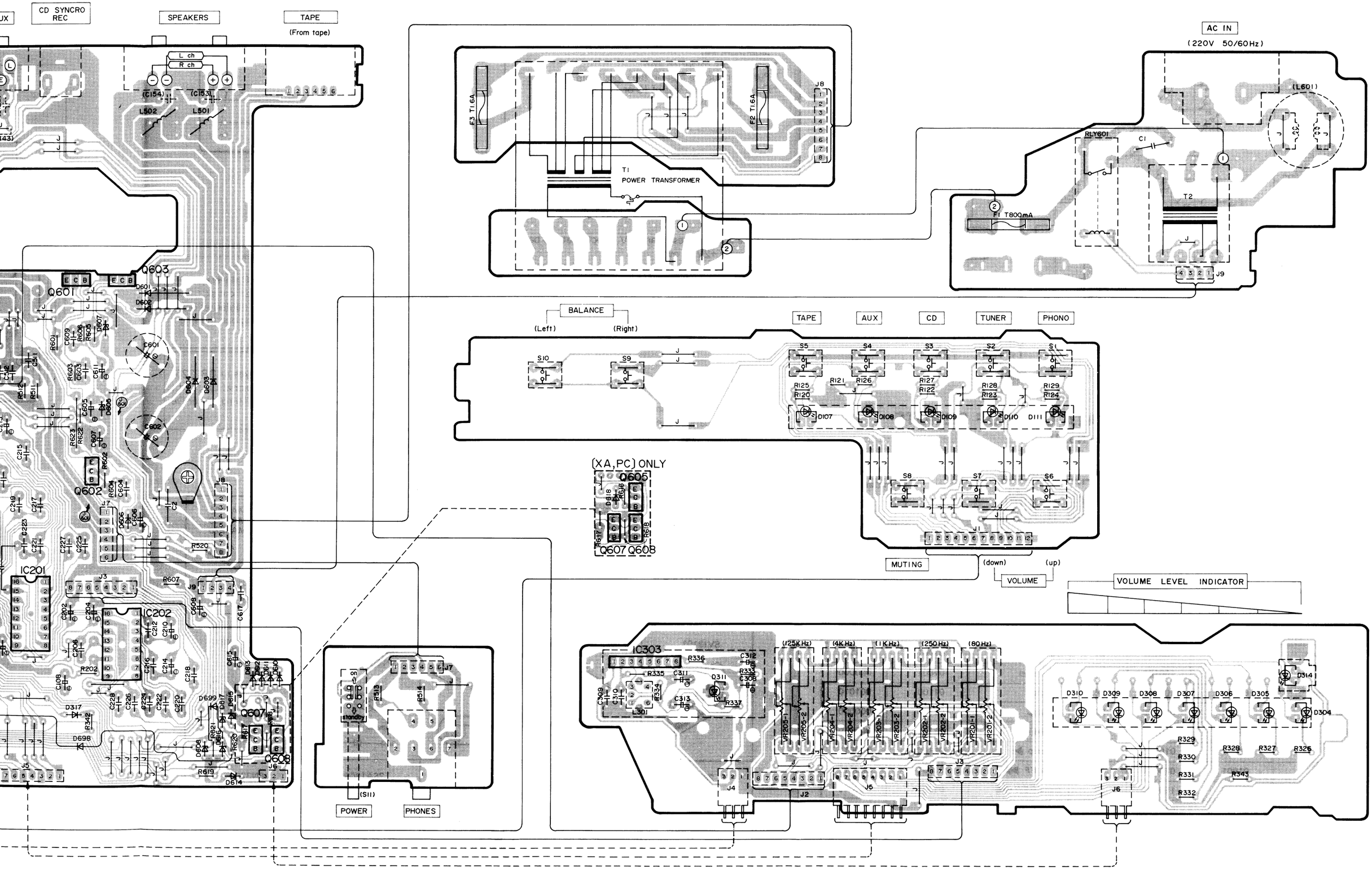
BATTERY

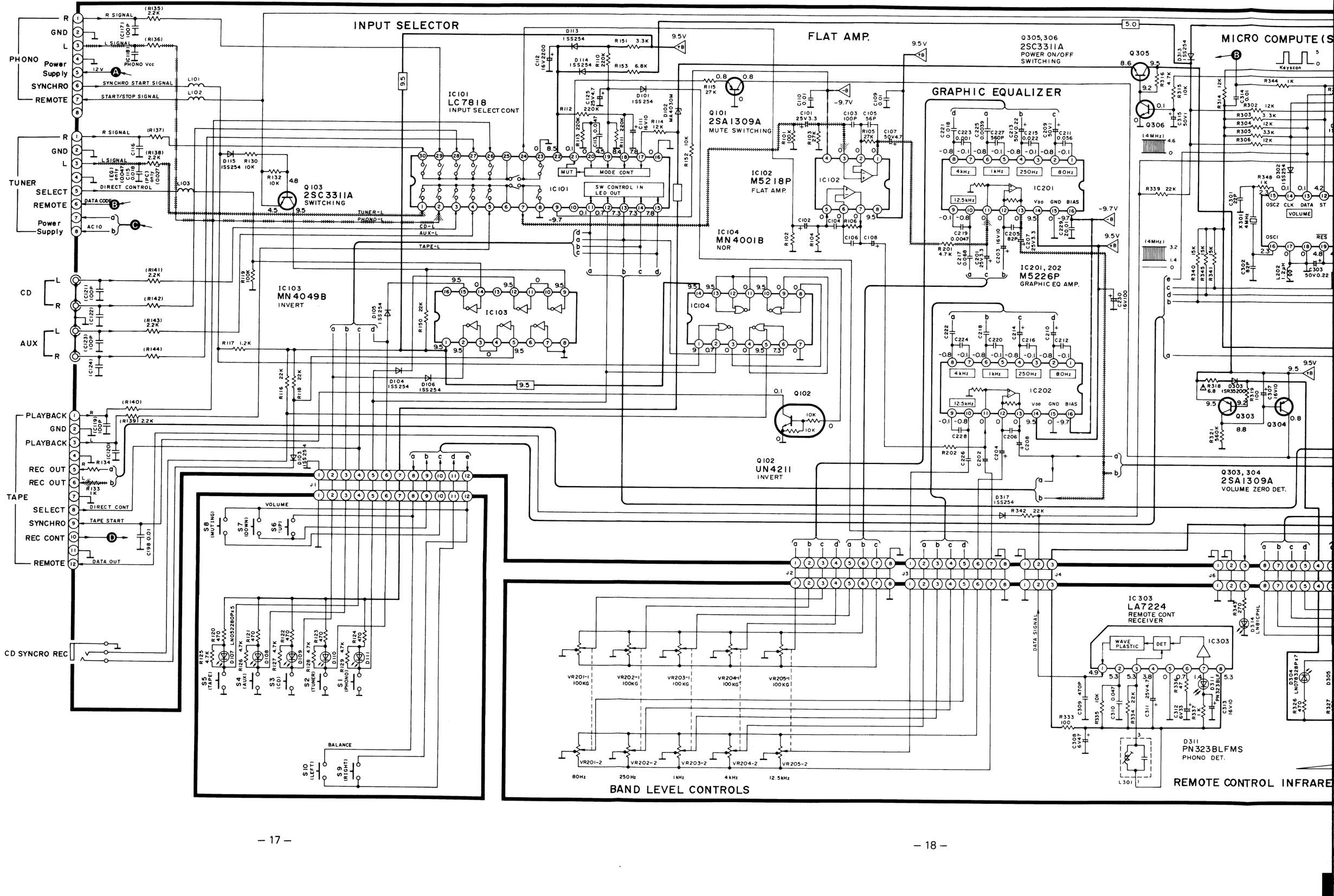
■ CIRCUIT BOARDS AND CONNECTION DIAGRAM








CD SYNCRO REC
SPEAKERS
TAPE
(From tape)
L ch
R ch
(C154)
(C153)
L502
L501
1 2 3 4 5 6
AC IN
(220V 50/60Hz)
(L601)
F3 T1.6A
F2 T1.6A
J8
T1
POWER TRANSFORMER
RLY601
C1
T2
F1 T800mA
J9
4 3 2 1
BALANCE
(Left)
(Right)
TAPE
AUX
CD
TUNER
PHONO
S10
S9
S5
S4
S3
S2
S1
R125
R120
R121
R126
R127
R122
R128
R123
R129
R124
D107
D108
D109
D110
D111
S8
S7
S6
(XA,PC) ONLY
Q605
Q607 Q608
MUTING
(down)
(up)
VOLUME
VOLUME LEVEL INDICATOR
Q601
Q603
Q602
Q607
Q608
IC201
IC202
IC303
(125K Hz)
(4K Hz)
(1K Hz)
(250 Hz)
(80 Hz)
D310
D309
D308
D307
D306
D305
D304
D314
R329
R330
R331
R332
R328
R327
R326
R343
standby
(S11)
POWER
PHONES


INPUT SELECTOR
FLAT AMP.
GRAPHIC EQUALIZER
MICRO COMPUTE(S
PHONO
TUNER
CD
AUX
PLAYBACK
TAPE
R SIGNAL
L SIGNAL
GND
Power Supply
SYNCHRO
REMOTE
SELECT
DIRECT CONTROL
DATA CODE
AC 10
PHONO Vcc
SYNCHRO START SIGNAL
START/STOP SIGNAL
REC OUT
TAPE START
REC CONT
DATA OUT
CD SYNCRO REC
IC101
LC7818
INPUT SELECT CONT
MUT
MODE CONT
SW CONTROL IN
LED OUT
Q101
2SA1309A
MUTE SWITCHING
Q103
2SC3311A
SWITCHING
IC102
M5218P
FLAT AMP.
IC103
MN4049B
INVERT
IC104
MN4001B
NOR
Q102
UN4211
INVERT
Q305,306
2SC3311A
POWER ON/OFF
SWITCHING
IC201,202
M5226P
GRAPHIC EQ AMP.
4kHz
1kHz
250Hz
80Hz
12.5kHz
Q303,304
2SA1309A
VOLUME ZERO DET.
IC303
LA7224
REMOTE CONT
RECEIVER
WAVE PLASTIC
DET
DATA SIGNAL
D311
PN323BLFMS
PHONO DET.
VOLUME
BALANCE
BAND LEVEL CONTROLS
REMOTE CONTROL INFRARE
TUNER-L
PHONO-L
CD-L
AUX-L
TAPE-L
9.5V
-9.7V
5.0

GRAPHIC EQUALIZER

IC201, 202
M5226P
GRAPHIC EQ AMP.

IC201
IC202

Q305, 306
2SC3311A
POWER ON/OFF SWITCHING

Q305
Q306

MICRO COMPUTE (SELECT CONTROL)

IC301
LC6523C-3068
MICRO COMPUTER

Keyscon

Q301
UN4214
RESET

IC302
DN74LS145
DATA COAD DET (INPUT SELECT CONTROL)

Q303, 304
2SA1309A
VOLUME ZERO DET.

Q307, 308
2SC3311A
REC POSITION HOLD

Q307
Q308

VOLUME CONTROL

IC401
TC9177P
ATTENUATOR (VOLUME)

IC402
M5218P
BUFFER

IC402
AN6558F
BUFFER (EG) only

Q309
2SC3311A
INVERT

POWER AMPLIFIER/PROTECTION

Q311
DTA114
DELAY

Q312
DTC114
DELAY (3 usec.)
(SCAN NOISE CANCEL)

IC501
SVI3101
POWER AMP. & PROTECTOR

Q501, 502
2SK301
MUTING

Q603

Q601
Q602

D601~604
GP15G

Q601, 603
2SD1265
REGULATOR

Q602
2SB941
REGULATOR

POWER SUPPLY

IC303
LA7224
REMOTE CONT RECEIVER

D311
PN323BLFMS
PHONO DET.

Volume level Indicators

REMOTE CONTROL INFRARED RECEIVER

Q605
2SC1685NC
REGULATOR

Q608
2SC3311A

Q607
UN4214
RELAY DRIVE
(POWER ON/OFF)

[XA, PC] only

■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

Notes:

1. **S1** : Input selector, **"Phono"** switch.
2. **S2** : Input selector, **"Tuner"** switch.
3. **S3** : Input selector, **"CD"** switch.
4. **S4** : Input selector, **"Aux"** switch.
5. **S5** : Input selector, **"Tape"** switch.
6. **S6** : Volume, **"Up"** switch.
7. **S7** : Volume, **"Down"** switch.
8. **S8** : Muting switch.
9. **S9** : Balance, **"Right"** switch.
10. **S10** : Balance, **"Left"** switch.
11. **S11** : Power switch in **"on"** position. (▙ standby, ▂ on/standby)
12. **S12 (For [XA,PC] areas only)** : Voltage adjust switch **"220V"** position. (127V ↔ 110V ↔ 220V ↔ 240V)
13. **S13 (For [XA,PC] areas only)** : Voltage adjust switch **"220 – 240V"** position. (110 – 127V ↔ 220 – 240V)
14. Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
    Measurement condition :
    Input Selector → Tuner (no signal)
    Volume Ind. → Level "1" light-up
15. ▒▒▒ Signal lines (L channel) ▒▒▒ Phono
16. ▬▬ Positive (+B) voltage lines.
    ▬▬ Negative (–B) voltage lines.
    (*) When only one system of speakers is connected, no sound will be if both selectors are pressed.
17. Important safety notice:
    Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

■ REPLACEMENT PARTS LIST

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
4. The parenthesized numbers in the column of description stand for the quantity per set.
5. The unit of resistance is OHM (Ω). K = 1000Ω, M = 1000KΩ
6. The unit of capacitance is MICROFARAD (μF). P = 10^{-6}μF

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value

Resistor Type	Wattage	Tolerance
ERD : Carbon	12 : 1/2W	J : ±5%
ERG : Metal Oxide	2A : 2W	K : ±10%
ERC : Solid	S2 : 1/4W	
	25 : 1/4W	
	S1 : 1/2W	

Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity

Capacitor Type	Voltage				Tolerance
ECE : Electrolytic	0J : 6.3V	0V : 66V			K : ±10%
ECC : Ceramic	1V : 35V	1J : 63V			Z : +80%, −20%
ECK : Ceramic	1C : 16V	KC : 400V AC			M : ±20%
ECF : Semi-conductor	1E : 25V	2A : 100V			P : +100%, −0%
ECQ : Polyester	D : 25V	2H : 500V			
	1H : 50V				

● RESISTORS

Ref.No.	Part No.	Value
R1	ERDS2TJ1R0	1
R101,102	ERDS2TJ104	100K
R103,104	ERDS2TJ273	27K
R105,106	ERDS2TJ273	27K
R110,111	ERDS2TJ224	220K
R112,113	ERDS2TJ224	220K
R114	ERDS2TJ123	12K
R115	ERDS2TJ273	27K
R116	ERDS2TJ223	22K
R117	ERDS2TJ122	1.2K
R118	ERDS2TJ223	22K
R119	ERDS2TJ104	100K
R120,121	ERDS2TJ471	470
R122,123	ERDS2TJ471	470
R124	ERDS2TJ471	470
R125,126	ERDS2TJ472	4.7K
R127,128	ERDS2TJ472	4.7K
R129	ERDS2TJ472	4.7K
R130	ERDS2TJ103	10K
R132	ERDS2TJ103	10K
R133,134	ERDS2TJ102	1K
R135,136 [EG]	ERDS2TJ222	2.2K
R137,138 [EG]	ERDS2TJ222	2.2K

Ref.No.	Part No.	Value
R139,140 [EG]	ERDS2TJ222	2.2K
R141,142 [EG]	ERDS2TJ222	2.2K
R143,144 [EG]	ERDS2TJ222	2.2K
R150	ERDS2TJ223	22K
R151	ERDS2TJ332	3.3K
R152	ERDS2TJ103	10K
R153	ERDS2TJ682	6.8K
R201,202	ERDS2TJ472	4.7K
R302	ERDS2TJ123	12K
R303	ERDS2TJ332	3.3K
R304	ERDS2TJ123	12K
R305	ERDS2TJ332	3.3K
R306,307	ERDS2TJ123	12K
R308,309	ERDS2TJ123	12K
R310	ERDS2TJ123	12K
R314	ERDS2TJ123	12K
R315	ERDS2TJ103	10K
R316	ERDS2TJ472	4.7K
R318 ⚠	ERD25FJ6R8	6.8
R319	ERDS2TJ101	100
R320	ERDS2TJ102	1K
R321	ERDS2TJ564	560K

Ref.No.	Part No.	Value
R322	ERDS2TJ333	33K
R323	ERDS2TJ103	10K
R324,325	ERDS2TJ473	47K
R326,327	ERDS2TJ471	470
R328,329	ERDS2TJ471	470
R330,331	ERDS2TJ471	470
R332	ERDS2TJ471	470
R333	ERDS2TJ101	100
R334	ERDS2TJ223	22K
R335	ERDS2TJ103	10K
R336	ERDS2TJ470	47
R337	ERDS2TJ102	1K
R338	ERDS2TJ123	12K
R339	ERDS2TJ223	22K
R340,341	ERDS2TJ153	15K
R342	ERDS2TJ223	22K
R343	ERDS2TJ271	270
R344	ERDS2TJ102	1K
R345	ERDS2TJ153	15K
R346	ERDS2TJ333	33K
R347	ERDS2TJ103	10K
R348	ERDS2TJ102	1K
R350	ERDS2TJ333	33K

Ref.No.	Part No.	Value
R401,402	ERDS2TJ472	4.7K
R403,404	ERDS2TJ224	220K
R501,502	ERDS2TJ102	1K
R503,504	ERDS2TJ124	120K
R505,506	ERDS2TJ124	120K
R509,510	ERDS2TJ124	120K
R511,512 ⚠	ERDS1FJ100	10
R513,514 ⚠	ERDS1FJ331	330
R520	ERDS2TJ154	150K
R522	ERDS2TJ563	56K
R523	ERDS2TJ154	150K
R601 ⚠	ERD25FJ3R9	3.9
R602 ⚠	ERD25FJ100	10
R603,604	ERDS2TJ682	6.8K
R605 ⚠	ERD25FJ4R7	4.7
R606	ERDS2TJ682	6.8K
R607 ⚠	ERDS1FJ391	390
R616[XA,PC]	ERDS2TJ472	4.7K
R617 ⚠	ERDS1FJ102	1K
R618	ERDS2TJ472	4.7K
R619	ERDS2TJ103	10K
R620,621	ERDS2TJ682	6.8K
R622	ERDS2TJ4R7	4.7
R623	ERG1ANJ151	150

● CAPACITORS

Ref.No.	Part No.	Value
C1	ECKDKC103PF2	0.01
C2[XL,XA,PC]	ECKD2H103PE	0.01
C2[Other]	ECQE1104KN	0.1
C101,102	ECEA1EK3R3	3.3
C103,104	ECCD1H101K	100P
C105,106	ECCD1H560K	56P
C107,108	ECEA1HK4R7	4.7
C109,110	ECKD1H103ZF	0.01
C111	ECEA1CKS100	10
C112	ECEA1CU222	2200
C113	ECFTD473KXL	0.047
C115,116 [PC]	ECFTD273KXL	0.027
C115,116 [EG]	ECFTD472KXL	0.0047
C115,116 [Other]	ECFTD183KXL	0.018
C117,118 [EG]	ECCD1H101K	100P
C119,120 [EG]	ECCD1H101K	100P

Ref.No.	Part No.	Value
C121,122 [EG]	ECCD1H101K	100P
C123,124 [EG]	ECCD1H101K	100P
C125	ECEA1EK4R7	4.7
C198,199	ECKD1H103ZF	0.01
C201,202	ECEA1EK3R3	3.3
C203,204	ECEA1CKS100	10
C205,206	ECCD1H820K	82P
C207,208	ECEA1EK3R3	3.3
C209,210	ECEA1HK010	1
C211,212	ECFTD563KXL	0.056
C213,214	ECEA1HKR22	0.22
C215,216	ECFTD223KXL	0.022
C217,218	ECFTD683KXL	0.068
C219,220	ECFTD472KXL	0.0047
C221,222	ECFTD183KXL	0.018
C223,224	ECFTD102KXL	0.001
C225,226	ECFTD392KXL	0.0039
C227,228	ECKD1H561KB	560P
C229	ECKD1H103ZF	0.01
C230	ECEA1CU101	100

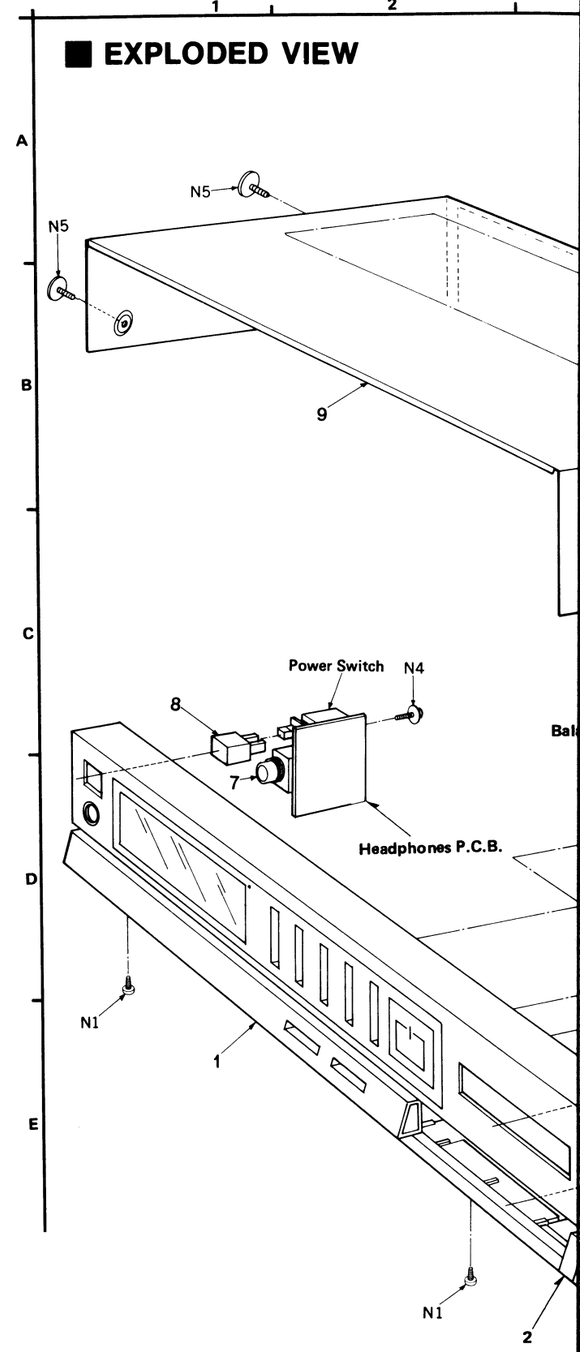
Ref.No.	Part No.	Value
C301	ECCD1H220K	22P
C302	ECCD1H820K	82P
C303	ECEA1HKR22	0.22
C304	ECEA0JU101	100
C305	ECEA1HK010	1
C307	ECEA1CKS100	10
C308	ECEA0JK470	47
C309	ECKD1H471KB	470P
C310	ECFTD473KXL	0.047
C311	ECEA1EK4R7	4.7
C312	ECEA0JK330	33
C313	ECEA1CKS100	10
C314	ECKD1H103ZF	0.01
C315	ECEA1HK010	1
C401,402	ECEA1HK010	1
C403,404	ECEA1CKS100	10
C407,408	ECCD1H101K	100P
C409,410	ECEA1CKS100	10
C501,502	ECEA1HK3R3	3.3
C503,504	ECKD1H221KB	220P
C505,506	ECKD1H821KB	820P

Ref.No.	Part No.	Value
C507,508	ECEA1CK220	22
C509,510	ECCD1H040CC	4P
C511,512	ECKD1H223ZF	0.022
C513,514 [EG]	ECKD1H102ZF	0.001
C520	ECEA1CU330	33
C521	ECKD1H333ZF	0.033
C522	ECKD1H103ZF	0.01
C601	ECETS42V472U	4700
C602	ECETS40V332X	3300
C603,604	ECKD1H103ZF	0.01
C605	ECEA1CKS100	10
C606,607	ECEA1CU470	47
C608	ECEA1CKS100	10
C609	ECKD1H103ZF	0.01
C611	ECEA1CU330	33
C615	ECEA1VU471	470
C617	ECKD1H103ZF	0.01
C1A	ECKD1H471KB	470P
C2A	ECKD1H121KB	120P
C3A	ECEA0JK101	100

Ref.No.	Part No.	Descripton
INTEGRATED CIRCUITS		
IC1	MN6013D	IC
IC101	LC7818	IC
IC102	M5218P	IC
IC103	MN4049B	IC
IC104	MN4001B	IC
IC201,202	M5226P	IC
IC301	LC6523C-3068	IC
IC302	DN74LS145	IC
IC303	LA7224	IC
IC401	TC9177P	IC
IC402[EG]	AN6558F	IC
IC402[other]	M5218P	IC
IC501	SVi3101	IC
TRANSISTORS		
Q1	UN1231	Transistor
Q101,303,304	2SA1309Q	Transistor
Q102	UN4211	Transistor
Q103,305~309, 608	2SC3311-Q	Transistor
Q301,607	UN4214	Transistor
Q311	DTA114ESTP	Transistor
Q312	DTC114ESTP	Transistor
Q501,502	2SK301-QRS	Transistor
Q601,603	2SD1265-0	Transistor
Q602	2SB941P	Transistor
Q605[XA,PC]	2SC1685-QNC	Transistor
DIODES		
D1	LN66	LED
D2,3	MA154WK	Diode
D101,103~106, 113,114,115, 301,302,313, 315~319,615, 698,699	MA165	Diode
D102	MA4030M	Diode, 3V Zener
D107~111	LN224WP	LED
D303	1SR35200	Diode
D305~310	LN863RCPP	LED
D311	PN323BLFMS	Diode, Photo
D314	LN81CPHL	LED
D601~604 ⚠	GP15GLF	Rect
D605,606	MA4100M	Diode,10V Zener
D607	MA4130M	Diode,13V Zener
D608,616	MA4051M	Diode,5.1V Zener
D610~613	MA167	Diode
D614	MA4056-M	Diode,5.6V Zener
D617	MA4082M	Diode,8.2V Zener
D618[XA,PC]	MA4270	Diode,27V Zener
COILS		
L1	ELEA101JA	Coil
L101,102,103	ELEPH101KA	Coil
L201,202	ELEPG1R2MA	Coil
L301	SLD9B3-Z	Coil
L501,502	SLQY07G-40	Coil
L601[EG]	SLQZ650MH49	Coil
TRANSFORMERS		
T1[EK,XL] ⚠	SLT5M474-W	Power
T1[XA,PC] ⚠	SLT5M475-W	Power
T1[Other] ⚠	SLT5M473-W	Power
T2[XA,PC] ⚠	SLT5i25	Stand by
T2[Other] ⚠	SLT5i24	Stand by
CRYSTAL		
X1	CSB420PB1	420kHz
X301	SVFCSA400MG	4MHz
VARIABLE RESISTORS		
VR201~205	EWG00110G15S	Graphic Equalizer
FUSES		
F1[EK] ⚠	XBA2C08TB0	250V, T0.8A
F1[Other] ⚠	XBA2C08TR0	250V, T0.8A
F2,3[EK] ⚠	XBA2C16TB0	250V, T1.6A
F2,3[Other] ⚠	XBA2C16TR0	250V, T1.6A
F4[XA,PC] ⚠	XBA2C16TR0	250V, T1.6A
SWITCHES		
S1~10	SSG13	Key
S11 ⚠	SSH1159	Power
S12[XA,PC] ⚠	ESE37263	Voltage Selector, (Rotary Type)
S13[XA,PC] ⚠	ESD39108S	Voltage Selector, (Slide Type)
RELAY		
RL601	SSY123	Power
BATTERY		
BAT1	BR2325-1VC	Lithium Battery

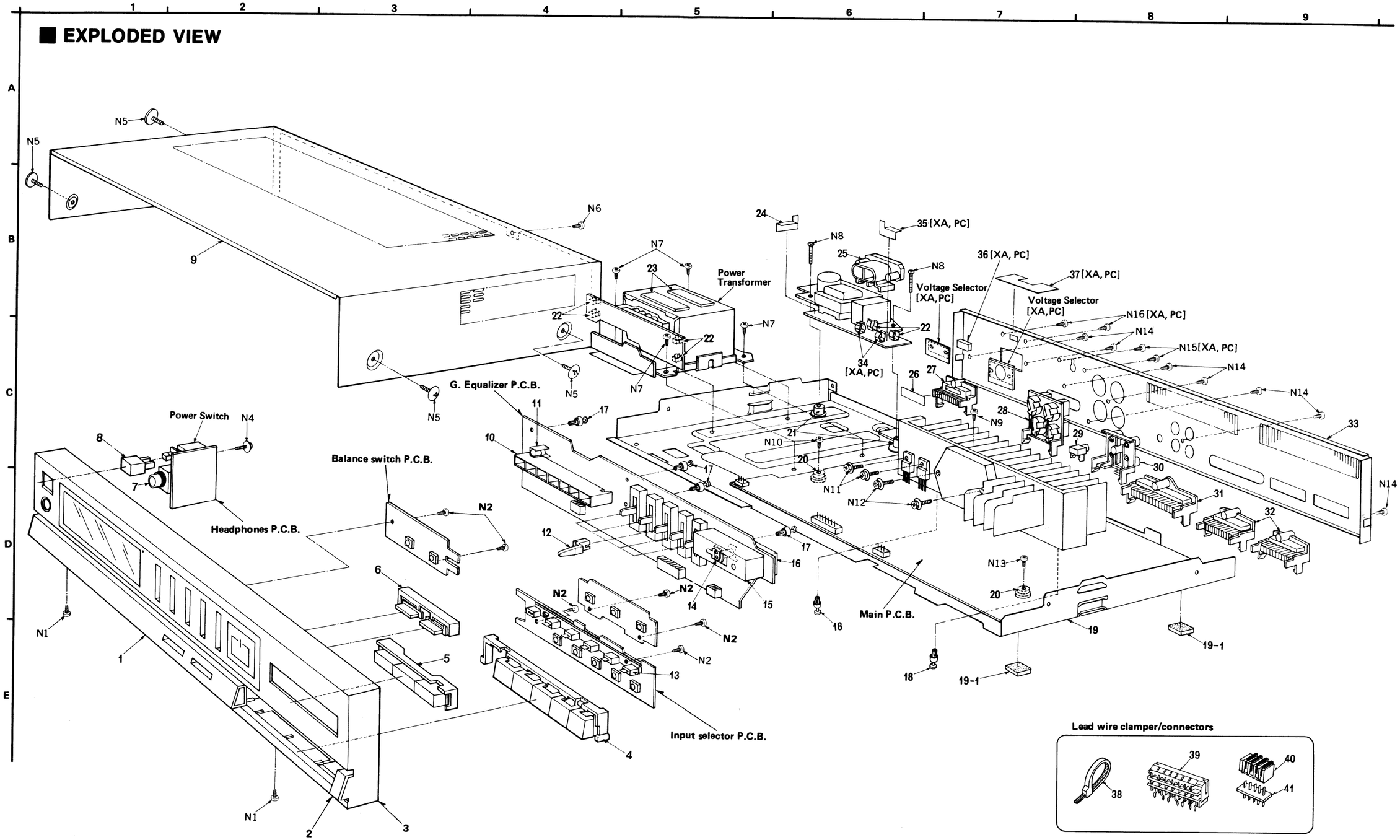
Ref.No.	Part No.	Description
CABINET AND CHASSIS PARTS		
1	SGX9023A	Ornament, A (1)
2	SGX9024	Ornament, B (1)
3	SGYUX33-KE	Front Panel Ass'y (1)
4	SBC765-1A	Button, Selector (1)
5	SBC762-2B	Button, Volume (1)
6	SBC764-2	Button, Balance (1)
7	SJJ63E	Headphone Jack (1)
8	SBC807-5	Button, Power (1)
9[EK]	SKCUX33-KK	Cabinet Ass'y (1)
9[Other]	SKCUX33-KE	Cabinet Ass'y (1)
10	LN078328P	LED Ass'y (1)
11	SMP386-1	LED Holder (1)
12	SBD105-4	Knob, Graphic Equalizer (5)
13	LNO52280P	LED Ass'y (1)
14	SHR9797	Diode Holder (1)
15	SMC1223-1	Shield Cover, Upper (1)
16	SMC6406	Shield Cover, Bottom (1)
17	SHR415	Nylon Pin (4)
18	SHR411	Nylon Pin (2)
19[EK]	SKUUX33-KK	Bottom Board Ass'y (1)
19[EG]	SKUUX33-KG	Bottom Board Ass'y (1)
[19−1	SKL293	Foot (4)
19[XL]	SKUUX33-KL	Bottom Board Ass'y (1)
19[XA,PC]	SKUUX33-KX	Bottom Board Ass'y (1)
19[Other]	SKUUX33-KE	Bottom Board Ass'y (1)
20	SHE170−1	P.C.B. Holder (2)
21	SHE181	P.C.B. Holder (2)
22	SJT390	Fuse Holder (6)
23	SHG6219	Rubber (2)
24	SMX531	Insulation Cover (1)
25[XL]	SJS9235-1	AC Inlet (1)
25[Other]	SJS9236	AC Inlet (1)
26	SMX785	Insulation Cover (1)
27	SJS604	Connector, Deck (1)
28	SJF4442	Speaker Terminal (1)
29	SJJ130-1	Jack, CD (1)
30	SJF3057N	Input Terminal (1)
31	SJS52	Connector, Deck (1)
32	SJS804	Connector, Phono/Tuner (2)
33[EG]	SGP6870B	Rear Panel (1)
33[XA,PC]	SGP6870-1A	Rear Panel (1)
33[Other]	SGP6870A	Rear Panel (1)
34[XA,PC]	SJT390	Fuse Holder (2)
35[XA,PC]	SMX531	Insulation Cover (1)
36[XA,PC]	SHE208	Spacer, Voltage Selector (1)
37[XA,PC]	SMX917	Insulation Cover (1)
38	SHR301	Clamper (3)
39	SJT30643-V	Socket, 6Pin (1)
39	SJT30843-V	Socket, 8Pin (3)
39	SJT31243-V	Socket, 12Pin (1)
40	SJS5341	Connector, 3Pin (2)
40	SJS5817	Connector, 8Pin (1)
41	SJT3311	Post, 3Pin (2)
41	SJT3805	Post, 8Pin (1)
SCREWS		
N1	XTB3+8JFZ	Tapping, :8 (2)
N2	XTB3+10B	Tapping, ⊕ 3x10 (6)
N4	XTWS3+8T	Tapping, ⊕ 3x8 (1)
N5	SNE2095-5	Cabinet (4)
N6	XTBS3+8JFZ	Tapping, ⊕ 3x8 (1)
N7	XTB4+6FFZ	Tapping, ⊕ 4x6 (4)
N8	XTB3+20J	Tapping, ⊕ 3x20 (2)
N9	XTB3+8JFR	Tapping, ⊕ 3x8 (1)
N10	XTBS3+12F1	Tapping, ⊕ 3x12 (1)
N11	SNE2117-1	Transistor (2)
N12	SNE2118	Power, IC (2)
N13	XTB3+12JFZ	Tapping, ⊕ 3x12 (1)
N14	XTBS3+8JFZ1	Tapping, ⊕ 3x8 (7)
N15[XA,PC]	XYN3+C6FZ	Voltage Selector (2)
N16[XA,PC]	XYN3+C12FZ	Voltage Selector (2)
ACCESSORIES		
A1[EK]	SFDAC05G02	AC Cord (1)
A1[XL]	SJA173	AC Cord (1)
A1[XA,PC]	SJA168-1	AC Cord (1)
A1[Other]	SFDAC05E02	AC Cord (1)
A2	SJP2257	Connection Cord (1)
A3[XA,PC]	SJP9215	Plug Adaptor (1)
A4	UM-3NEP-2P	Battery (2)
A5[EK]	SQF12791	Instruction Book (1)
A5[XA]	SQF12819	Instruction Book (1)
A5[Ei]	SQF12734	Instruction Book (1)
A5[PC]	SQF12818	Instruction Book (1)
A5[EG]	SQF12733	Instruction Book (1)
A5[Other]	SQF12732	Instruction Book (1)

■ EXPLODED VIEW



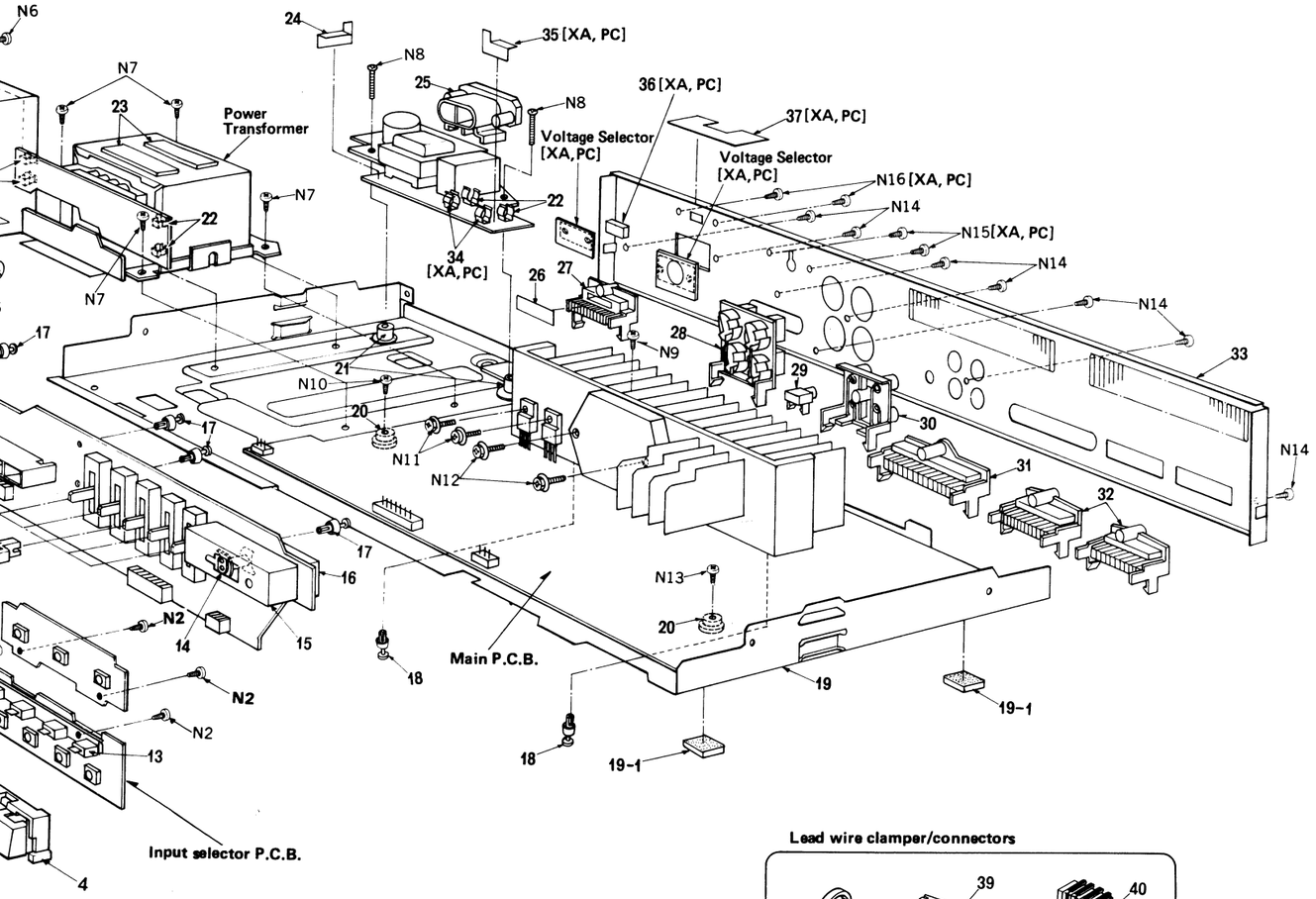
Ref.No.	Part No.	Description
PACKING PARTS		
P1[EK]	SPG5708	Carton Box (1)
P1[EF]	SPG5707	Carton Box (1)
P1[Other]	SPG5706	Carton Box (1)
P2	SPS4657-1	Pad, Left (1)
P3	SPS4658-3	Pad, Right (1)
P4	SPS4754	Pad, Remote Control (1)
P5	SPS4775	Pad, Upper (1)
P6	SPP741	Polyethylene Bag (1)

■ EXPLODED VIEW

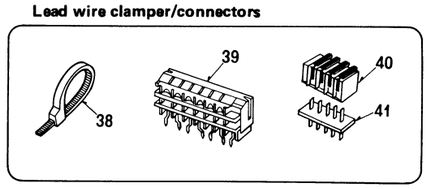


Lead wire clamper/connectors

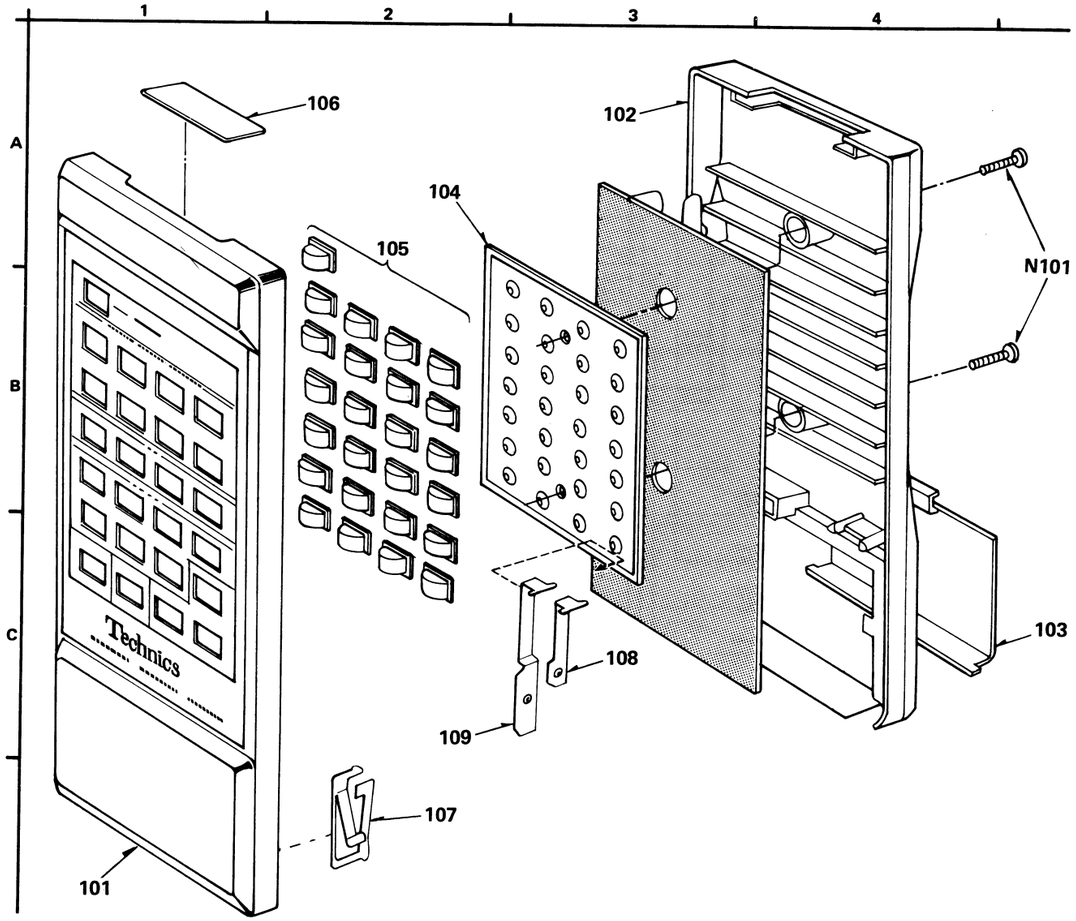
Ref. No.	Part No.	Description	
PACKING PARTS			
P1 [EK]	SPG5708	Carton Box	(1)
P1 [EF]	SPG5707	Carton Box	(1)
P1 [Other]	SPG5706	Carton Box	(1)
P2	SPS4657-1	Pad, Left	(1)
P3	SPS4658-3	Pad, Right	(1)
P4	SPS4754	Pad, Remote Control	(1)
P5	SPS4775	Pad, Upper	(1)
P6	SPP741	Polyethylene Bag	(1)



Lead wire clamper/connectors



- **Remote Control Unit (Transmitter)**



● REMOTE CONTROL UNIT

Ref.No.	Part No.	Description	
REMOTE CONTROL			
101	UR64VCS104	Top Case Ass'y	(1)
102	UR64VCS105	Bottom Case Ass'y	(1)
103	UR64EC121	Battery Cover	(1)
104	UR64CT122	Rubber Contact	(1)
105	UR64BT123A	Button	(25)
106	UR64SB125	Tinted Plate	(1)
107	UR64TD127	Battery Terminal, ⊕	(1)
108	UR64TD128	Battery Terminal, ⊖	(1)
109	UR52TD101	Battery Terminal, ⊕, ⊖	(1)
SCREW			
N101	XTS26+12GFZ	Tapping, ⊕2.6x12	(2)

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